An Essay on
The Lymphatic System
Respectfully Submitted
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By
Orton W. Peterson
Canoga, Seneca Co
N. Y.

The Symphatic system.

The human body is a wonderful, and curious piece of mechanism. It is made up of various constituents combined into different organs, each with its particular sphere of action; which, taken as a whole, exhibits the wonderful power, perfection, and wisdom, of its divine Creator. And not only is this complex and complicated body, wonderfully wrought, but it is endowed with life making it a moving monument of greatness and superior wisdom. Nay more! this life is actuated by an inherent

power, namely the mind. The gift of this faculty, places us in the highest scale of organized beings predominant on this Earth.

Among the different constituents of the body; one of the most important, is that of the Lymphatic System, in consequence of its relative function in sustaining life.

The minuteness, usefulness, and general diffusibility, of these important vessels; their construction, situation, and liability to become unable to perform the requisite duties assigned them; renderes it very essential to the student of Medicine, who is preparing to practice on scientific principles, that their

relative importance in maintaining and supporting, by their absorbent powers, the nutriment for our physical support, should not be lost sight of, nor overlooked when any abnormal departure from health presents itself for consideration

This indispensable and intricate system, consists of three structures intimately connected, namely; the Lacteals, the Lymphatic vessels, and the Lymphatic glands.

The lymphatics may be said to originate upon every free surface throughout the body, in a plexiform network of extreme tenuity, from which the lymphatic vessels

proceed, ending ultimately in the Thoracic duct.

These vessels are very minute, delicate, and transparent: remarkable for their elasticity; and uniformity of size, notwithstanding their numerous anastomoses: also their knotted appearance, from the presence of numerous valves, and their division into several branches before entering a gland.

From the extreme tenuity of the lymphatic vessels, their structure is in part at least, conjectural. Yet allowing our inferences to be drawn from the thoracic duct, they consist of an external, middle, and internal coat. The first

consisting of interlacing fibres, that cross each other in every direction. The middle coat corresponds with that of the arteries and veins, being thin and elastic, presenting longitudinal fibres, blended with traces of annular fibres on the outside

The internal or serous coat is very thin, transparent, and delicate, consequently, more easily ruptured than the external coat.

The valves of the lymphatic vessels are for the purpose of facilitating the movement of their contained fluids in the proper direction; being analogous to those of the veins they generally consist of

two semilunar flaps attached by their convex border to the sides of the vessels, their concave borders remaining free.

At times these flaps may extend around these tubes, leaving only a central aperture, which can be closed only by its contractile power.

The diversities of arrangement found in these valves are more numerous at or near their anastomoses, while the valves are most abundant near the glands.

The absorbent vessels are generally divided into three divisions, namely Superficial, deep seated, and lacteals.

The superficial lymphatic vessels are situated on the surface of

the body, and accompany the veins in their various directions, while at convenient places, they unite with the deep lymphatics through the fascia

The deep seated lymphatic vessels are not so numerous, though somewhat larger than the superficial vessels and follow the course of their respective arteries and veins.

The lacteal vessels are confined to the abdominal viscera, and in structure are analogous to the lymphatic vessels.

The superficial and deep seated lymphatic vessels of the inferior extremities are in proximity with their respective bloodvessels;

The superficial being arranged in two anastamosing groups, one of which is external, the other internal, ultimately terminating in the Saphenous group of inguinal glands, and the deep-seated group in the iliac region.

The Superficial lymphatic vessels of the trunk, are those of the thorax superiorly, and of the abdomen inferiorly; the former pass upwards and outwards, a portion of them to the axilla, by a chain of lymphatic vessels on the lower border of the pectoralis major muscle, the remainder to the inferior portion of the neck.

The latter, together with those

of the external organs of generation of the perinæum, and of the glutæal region, join the superficial group of inguinal glands.

The deep seated lymphatic vessels of the thorax, are named from their situation with their respective organs, as the internal mammary, intercostal, diaphragmatic, mediastinal, lungs, heart, & bronchi; their ultimate termination being at the root of the neck, those of the right side into the tributaries of the Ductus lymphaticus dexter, and those of the left side in the thoracic duct.

The deep lymphatic vessels of the abdomen continue upwards

from beneath Pouparts ligament, along the external iliac vessels to the lumbar glands, being joined in their course, by the Epigastric, Circumflex ilii, and ilio-lumbar lymphatic vessels.

These lumbar vessels having received all the lymphatics of the inferior extremities, pelvis, and loins, terminate in the receptaculum chyli by several large trunks.

The lymphatic vessels of the, Liver, Spleen, Pancreas, Kidneys, and Supra-renal Capsules, also those of the Stomach have various terminations each communicating with the other before entering the thoracic duct, some piercing the

diaphragm and uniting with the anterior and posterior mediastinal glands, also those around the inferior vena-cava, and of the aorta.

Others unite with the lumbar glands and with those of the lesser omentum.

The lymphatic vessels of the small intestines are of two kinds, namely, Lymphatics and Lacteals, being thus named from the fact of their conveying fluids of different colour and degree of nourishment.

The former are situated on and accompany the structure of the intestine before entering the mesenteric glands.

The lacteals originate in the mucous membrane of the intestines, from the centre of each villous as a caecal tubulus, this opening in a fine network of the submucous tissue. From this network the lacteals are traced to the lymphatic glands of the mesentary and from thence to the thoracic duct. The lymphatic vessels of the abdominal viscera all unite with the mesenteric glands, except those of the descending colon and rectum, they uniting with the lumbar glands. The lymphatic vessels of the superior extremities accompany the veins superficially, and the arteries and veins deep seated, these groups being more marked above the elbow, the most

numerous accompanying the basalic vein to the axilla. The other group with the cephalic vein gives off several branches, which cross the biceps muscle to the axilla; the remainder continues with the vein, in the interspace of the deltoid and pectoralis major muscle, joining a gland, then paping over the pectoralis minor muscle to unite with the Subclavian lymphatics; those of the left side terminating in the thoracic duct: and those of the right side in the Ductus lymphaticus dexter. The lymphatic vessels of the head, face, and neck, are numerous, and communicate

with many and important glands, as the Parotid, Submaxillary, Lingual, and Cervical of the neck, and accompany the jugular veins, till they communicate with the thoracic vessels and glands, and terminate in the Thoracic duct; and the Ductus lymphaticus dexter. The glands through which the lymphatic vessels pass are named lymphatic glands; and are placed at various distances from each other, as to their required functions. They are Spheroid, oblong, or flattened bodies, varying in size from a pins head to that of an almond-kernel. In health the largest are found in the lungs,

and the smallest in the omentum,
yet from irritation, or disease,
are subject to many and
singular variations.
Their external appearance is lobular
while the face of a section presents
a cellular appearance from the
numberless convolutions formed
by the vessels going to make
up its structure, which consists
of a plexus of lymphatic vessels,
associated with a plexus of blood
vessels, and these enclosed in
a thin capsule of areolar tissue,
connecting the lobes of the gland
with its vessels and their
contiguous parts.
Their color is of a grayish red

excepting those of the lungs and bronchi, which in adult life have a more or less blackish appearance.

The absorbent vessels enter in and pass through these glands either directly or indirectly.

Those entering the glands, are termed, vasa afferentia, and those leaving, vasa efferentia, the former varying in number, being divided at the distance of a few lines before entering a gland; the latter coalescing after leaving the gland.

These glands are supplied with fluid, which has been compared to the plasma of the blood, and also with corpuscles resembling blood globules in form.

These glands are found throughout every part of the body, with the lymphatic vessels, being more numerous in the superior part of the body, than the inferior; and may be supposed to derive from the blood in the capillaries of the lymphatics; materials which are discharged into the lymphatic vessels for further use.

The Thoracic duct is for the final reception of the contents, of the lymphatic vessels, of the left side of the head, neck, superior extremity, superior portion of the trunk, the whole inferior portion with its enclosed viscera, and of the inferior extremities; before

emptying their contents into the general circulation.

The duct lies in front of the vertebral column, commencing inferiorly opposite the second lumbar vertebra behind and between the aorta and the inferior vena cava, and in close proximity to the right crus of the diaphragm, by a somewhat triangular dilatation the receptaculum chyli; from thence it ascends through the aortic opening of the diaphragm, and between the thoracic aorta and vena azygos, to the fourth dorsal vertebra; from thence it inclines to the left side, and passes behind the arch of the aorta,

and ascends by the side of the oesophagus, posterior to the perpendicular portion of the left subclavian artery opposite the seventh cervical vertebra, where it curves downwards and forwards terminating at the junction of the left subclavian, with the left internal jugular vein.

The size of this duct may be compared to that of a goose quill, and at about the middle of the thorax it not unfrequently divides into two or more branches assuming a plexiform arrangement which again unites.

It has also been known to bifurcate at the upper part of the thorax, one branch opening into the point of

junction between the right subclavian and jugular veins, while the other terminates at its normal junction on the left side.

This duct presents fewer valves than the lymphatic vessels generally, while at its termination it is provided with a pair of semilunar valves to prevent the admission of venous blood into its cylinder.

The Ductus lymphaticus dexter, is a short trunk, receiving the lymphatic vessels of the right side of the head, neck, superior extremity, thorax, right lung, and one or two branches from the liver. This duct terminates at the junction of the right subclavian, with the right

internal jugular veins, where they unite to form the vena innominata; and like the thoracic duct is supplied with semilunar valves.

Absorption by the lymphatics is regarded at the present day, as the most active agent in promoting the proper functions, requisite for the growth of the body; and also for removing those particles of organic texture capable of subserving that function, which are partially removed by the process of secretion, to be in turn employed in repairing the waste and wear of the body.

Chyle the result of digestive absorption is the fluid taken up

by the lacteals during the process of digestion; and is of a milky consistence having a peculiar odor, an alkaline taste, and being somewhat lighter in color while fasting.

Lymph the product of nutritive absorption, is the fluid traversing the lymphatic vessels, differing only from the chyle, in being nearly transparent, and by analysis not containing so much nutritive quality; having less albumen, less fibrin, and only a trace of fatty matter.

From the foregoing outline of these important vessels, and their relative position, we see

the importance of their normal action to the promotion of health; and from their minuteness how liable to become obstructed, thereby producing abnormal changes, the nature and description of which we leave to the enquiring Pathologist.